REMARKS

This revised amendment is submitted in response to the Notice of Non-Compliant Amendment dated 20 August 2003. In this amendment all claims have been listed, showing their current status. In all other respects the present amendment is the same as originally submitted on 7 august 2003.

In the Office Action dated 2 May 2003, claims 1-17 were rejected under 35 USC 112, paragraphs 1 and 2 with respect to the use of the terms "basis object," "basis function," and "spatial relationship." In this Amendment, one paragraph in the specification has been amended to correct a typographical error. No claims have been amended. No new matter has been added.

Applicants respectfully traverse the rejections of the pending claims under section 112, first and second paragraphs. Applicants submit that the nomenclature used in the specification and the claims is adequately disclosed in the specification and clearly enables one skilled in the art to practice the claimed invention.

The specification uses the nomenclature "basis object" and "basis function" in describing components that make up the mathematical model of a moving organ. By accurately modeling the complex motion of a moving organ such as a heart, the present invention enables one to account for artifacts arising from the motion so as to generate good imaging data representing the organ. The basis object and basis function terminology are used interchangeably to refer to the mathematic representations of component parts of the organ structures to be modeled, with the basis function nomenclature directed to specific mathematic statements that describe a shape. As mathematic expressions, they can be of two types, as stated on page 4, lines 18-26: polygonal basis functions or analytical basis functions. One or more basis functions may comprise a model of the organ. In each case, a mathematical expression (function) is used for representing some portion of the moving object to be imaged.

For example, on page 5, lines 25-29, it is pointed out that the basis objects of the present invention are generally defined by quadratic equations, meaning the equations are second order and can be so manipulated. Polygonal basis objects are used for defining segments of the modeled object that experience torsion (page 5, lines 5-6). To depict motion of the structure, the basis functions (the equations describing the object) are manipulated by operators that shift, scale and rotate the basis functions (in other words, modify the equations defining the basis objects). See page 6, lines 1-3. Analytical basis objects are used in mathematically defining component structures that are not subject to torsion. Page 6, lines 7-10.

For example, as set forth on page 14, lines 17-29, a left ventricle of a heart is modeled by defining basis objects that may comprise a pair of discrete ellipsoidal basis functions. These basis functions may be prolate spheroids comprised of triangular segments, i.e. polygonal basis functions. Multiple basis objects are used to represent the interior and exterior walls of the ventricle, which experience a torsion motion during the normal cardiac cycle.

The movement of different component parts of a modeled object with respect to one

another, e.g., the interior and exterior walls of a ventricle, relates to the "spatial relation" between the objects. Applicants respectfully submit that it is well known in the art and in patent practice to use the terminology "spatial relation" and the like to describe component parts that are disposed in some physical relationship with one another. As is further made clear in the specification, modeling a moving organ such as a heart necessarily involves describing respective component structures of the organ that move with respect to one another; hence the reference to the spatial relation between the basis objects, which are described in the specification as each representing a respective portion of the organ being modeled. This approach enables the movement of the separate portions of the organ to be separately defined, thereby enabling one to apply operators to the basis objects that enable one to model the motion of the entire organ. See, e.g., page 12, lines 11- 25.

The Office Action further stated that the terms "capable of being transformed" and "can be performed" rendered the claims indefinite under section 112, second paragraph. Applicants respectfully submit that such language does not render the claims indefinite as the language clearly enunciates a characteristic of the model or basis objects and thus is a positive recitation of an aspect of the invention. For example, as described in the specification at pages 11-13, transformation operators are applied to the basis objects to enable modeling of a moving organ. The transformation operators are not only temporal, but also represent the elongation and torsion that takes place in different portions of the organ. Thus, e.g., the recitation in claim 1 that the model is "capable of being transformed by one or more transformation operators" is a positive statement of one aspect of the model – that is, the model can be driven by the operators to reflect the complex movements of the organ. Similarly, as in claim 5, the recitation that the transformation operators "can be performed on the basis objects as a function of time" positively recites a characteristic of the basis object.

For the reasons set forth above, Applicants respectfully request that the rejection of claims 1-17 be withdrawn and the claims be examined on the merits.

Respectfully submitted,

Donald S. Ingraham
Reg. No. 33,714

General Electric Company
Building K1, Room 4A70
Schenectady, New York 12301

15 September 2003

Telephone: (518) 387-5073 or
(518) 387-7122